



**OVERVIEW | STATUS OF 12/2017 | E
ANNEALING**

Normal annealing
Stress relief annealing
Soft-annealing | Solution annealing

Coarse-grain annealing
Sub-critical annealing
Homogenizing

Fully automated Process

Dimensions: max. 5000 mm
x 5000 mm x 12000 mm

ANNEALING

means the treatment of a work piece at a certain temperature and a certain soaking period and subsequent cooling off adapted to the material properties aimed for.

ANNEALING PROCESS:

- Normal annealing
- Stress relief annealing
- Soft-annealing
- Coarse-grain annealing
- Sub-critical annealing
- Homogenizing
- Solution annealing

Normal annealing is usually carried out after previous hot forming of components. Heating is carried out up to a temperature slightly above the hardening temperature, with subsequent cooling off in still atmosphere in order to achieve an even structure.

Stress relief annealing is annealing at sufficiently high temperatures (for hardened and tempered steels however, below the last tempering temperature), with the aim to decrease the residual stresses without significant structural changes and mechanical properties.

Soft-annealing means annealing at a temperature slightly below the lower critical point with subsequent, slow cooling off, in order to achieve as soft a state as possible.

Coarse-grain annealing, also called high annealing, is carried out at a temperature above the hardening temperature with adequate cooling off, in order to achieve a coarser grain (e.g. for improving grindability).

Homogenizing is annealing at very high temperatures in the recrystallization area. The aim is for example to partially or completely reverse the property and structural changes having occurred after cold forming, without causing a structural transformation.

Solution annealing is mainly carried out for austenitic steels for releasing deposited component parts in mixed crystals and for eliminating stresses from previous strain-hardening.

ADVANTAGES OF ANNEALING:

- Improvement of mechanical properties
- Optimization of mechanical processing (non-cutting and metal-cutting)
- Improvement of metal states for cold forming
- Lowering of processing and machining stresses
- Recovery of original state